UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Region 5
Superfund Division
77 West Jackson Boulevard
Chicago, Illinois 60604

DATE : April 17, 2001

SUBJECT: Radiation Survey, JPITT Melt Shop, Chicago, Illinois

FROM: Larry Jensen, CHP
Senior Health Physicist
Emergency Response Section #3

TO: Brad Benning
On-Scene Coordinator
Emergency Response Section #3

On April 12 and 13, 2001, Gerald Gels, U.S. Environmental Protection Agency (USEPA) Emergency Response Team (Signal Corporation) and I surveyed the JPITT Melt Shop at 3151 S. California Avenue, Chicago, Illinois 60608 for radioactive materials.

We walked the entire ground floor and, also the upper level where what we believe the "caldron" that was used to melt scrap metal was. A two by two sodium iodide detector and a FIDLER sodium iodide detector were used for surveillance and a SAM portable multi-channel analyzer was used for radionuclide detection. Thirteen major sources were found.

Three of these were large cylinders, about 3 feet in diameter and about 3 feet high. The SAM detector established that they each contained a cesium-137 source. Exposure rates are shown on the attached sketches. These levels were low enough that response personnel can work in the vicinity without acquiring a significant dose. However, judging by the thickness of the lid, I believe that there is a strong source inside. Records showed that the previous owner purchased several 1.25 curie cesium-137 sources. If these are inside, removal of the lid could expose a source that could cause very significant dose or even death. Thus, in no case should these devices be dismantled. Smears taken on all three devices showed no removable material.

The ten remaining sources were "needles" about 5 inches long and about ½ inch in diameter at the base. The "needle" portion of this was about 4 inches long and about 1/16th to 1/8th inch in diameter. There was a section about 1 inch long and about 1/8th inch in diameter at the tip that appears to be the source. These were also identified as cesium-137 with the SAM detector. [Later you called to say that you had been told these are devices imbedded in the refractor brick that melt away when the brick

deteriorates and needs replacing. Monitoring outside the container periodically with a survey meter would show a decrease in count rate when the brick needs replacement. Based upon my experience, this is plausible.] The remaining ten sources were measured (as a group) to be about 4.5 milliroentgen per hour on contact with the SAM. This dose rate would give the equivalent of a chest X-ray in about 2 hours. Because these sources are potent and small in size, I strongly recommend that they be isolated [In a discussion with you on April 16, you suggested putting them in the opening of one of the three large devices discussed in the previous paragraph. This is a good idea so long as a strong cover is placed over the opening. There should be a radiation label there as well. Also, in transferring the sources, care should be used in worker protection by the using of tongs, short transfer times and shielding if possible.].

Records that you discovered showed that the previous owner, Charter Electric Melt, had purchased several 1.25 curie cesium-137 sources from the company Ronan. These are strong sources and have the potential to be lethal if mishandled. Therefore, great care should be exercised in this response action with regard to any radioactive sources so that workers are not put at risk.

Your records also showed that Charter Electric Melt had a Nuclear Regulatory Commission (NRC) license (NRC 12-20231-01) and an Illinois Department of Nuclear Safety (IDNS) license (IL-01040-01). These 13 sources, and possibly others, could have been covered by these licenses. Roland Likus of the Nuclear Regulatory Commission's Region III Lisle, Illinois, office said that, because Illinois is now an NRC Agreement State, license questions will be handled by the IDNS. I tried to reach Mr. Joseph Klinger, Chief of IDNS's Division of Radioactive Materials, and Mr. Gib Vinson in their licensing program to discuss these issues but was not able to get phone calls returned.

On Friday, April 13, Andrew Gulczynski and Joanne Kark of the Illinois Department of Nuclear Safety's Glen Ellyn office answered my April 12 call for assistance. Mr. Gulczynski said that the license had been terminated and Ronan had verified that all sources had been returned. Thus, the origin of the 13 sources USEPA found is in question but they could reasonably be presumed to be connected to the former licensees. Because of the potential for serious radiation injury if there are still large cesium-137 sources onsite, I would recommend that IDNS be asked to conduct a full building inspection as soon as possible. Mr. Gulczynski said such a survey would be conducted, but not until all the hazardous chemicals were removed.

In such a survey, I would recommend that the bottom of the "caldron" be looked at. There is some belief that the 3 large devices were extrusion devices where hot melt was converted to billets. The logo of JPITT, painted on a wall, and, also, the Charter Electric Melt sign in one office, are identical and show what could be interpreted as metal being extruded out the bottom of a caldron. Thus, there could be more sources on the site. Mr. Gels and I were not able to inspect the base of the caldron.

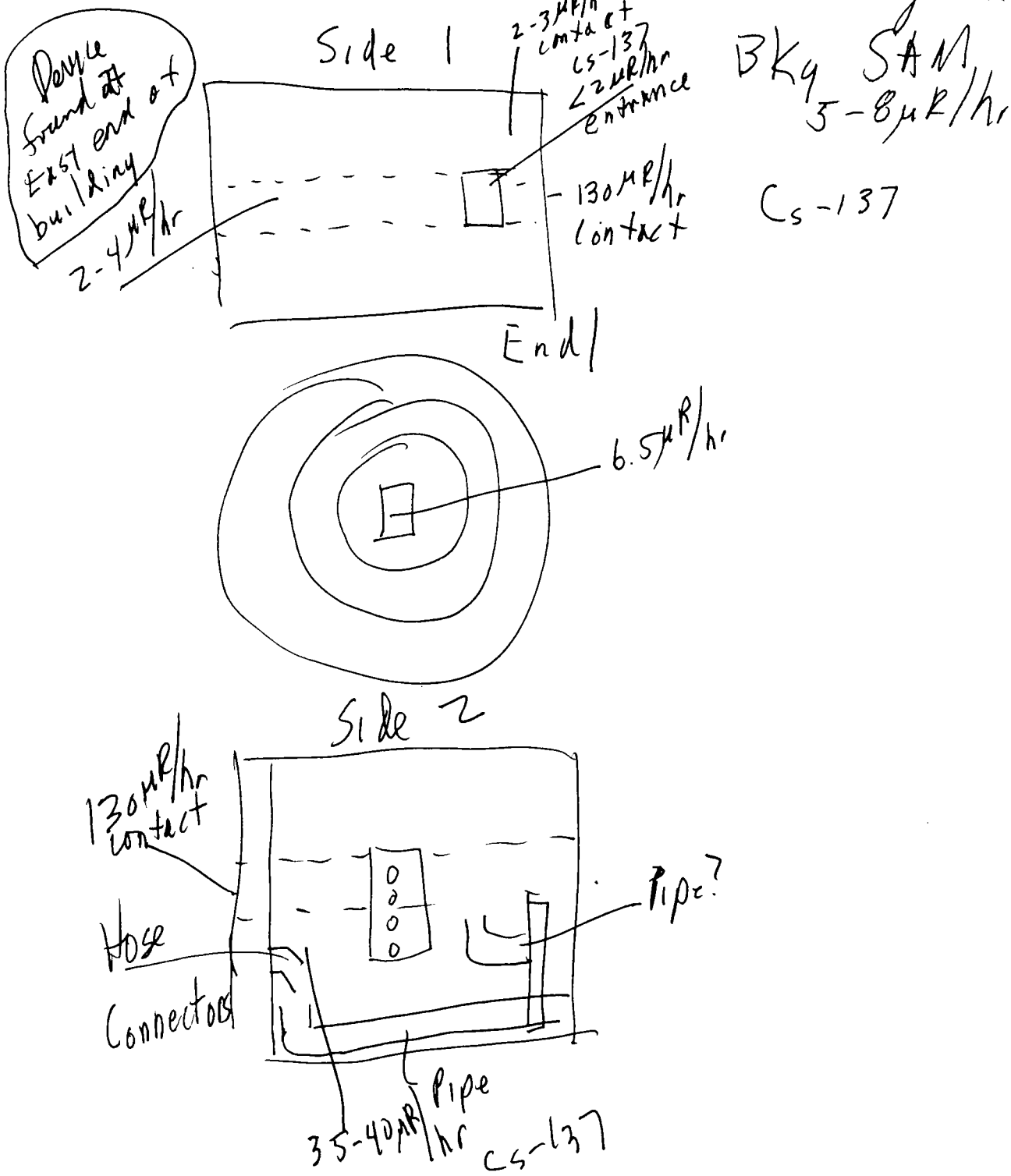
In addition to the 13 devices discussed above, there are numerous other radioactive materials in this building. These consist of bags of materials, "doughnut" shaped objects, disk shaped objects, formed materials, "dirt" and bricks. These were measured to be uranium and thorium materials, presumably unlicensed, uncontrolled Naturally Occurring Radioactive Materials (NORM). Our measurements show that they do not present a worker exposure problem. They are probably commercial materials that are not identified and treated as radioactive in the general environment. IDNS would be the determiner on official control issues. Mr Gulczynski and Ms Kark took 500 milliliters for spectral analysis of MarPatch-Z, a bagged material found on the upper level near the "caldron" that showed the highest count rate.

The licenses held by Charter Electric Melt and JPITT Melt Shop should be reviewed to see what sources were onsite. It should be determined if Charter transferred their license to JPITT and if JPITT officially terminated their license when they went bankrupt in 1997. Review of any closeout surveys by IDNS and/or NRC could help establish if there are remaining sources onsite. I would strongly recommend this for protection of our workers if nothing else, especially if IDNS does not plan to reenter the building until the chemical hazards are removed.

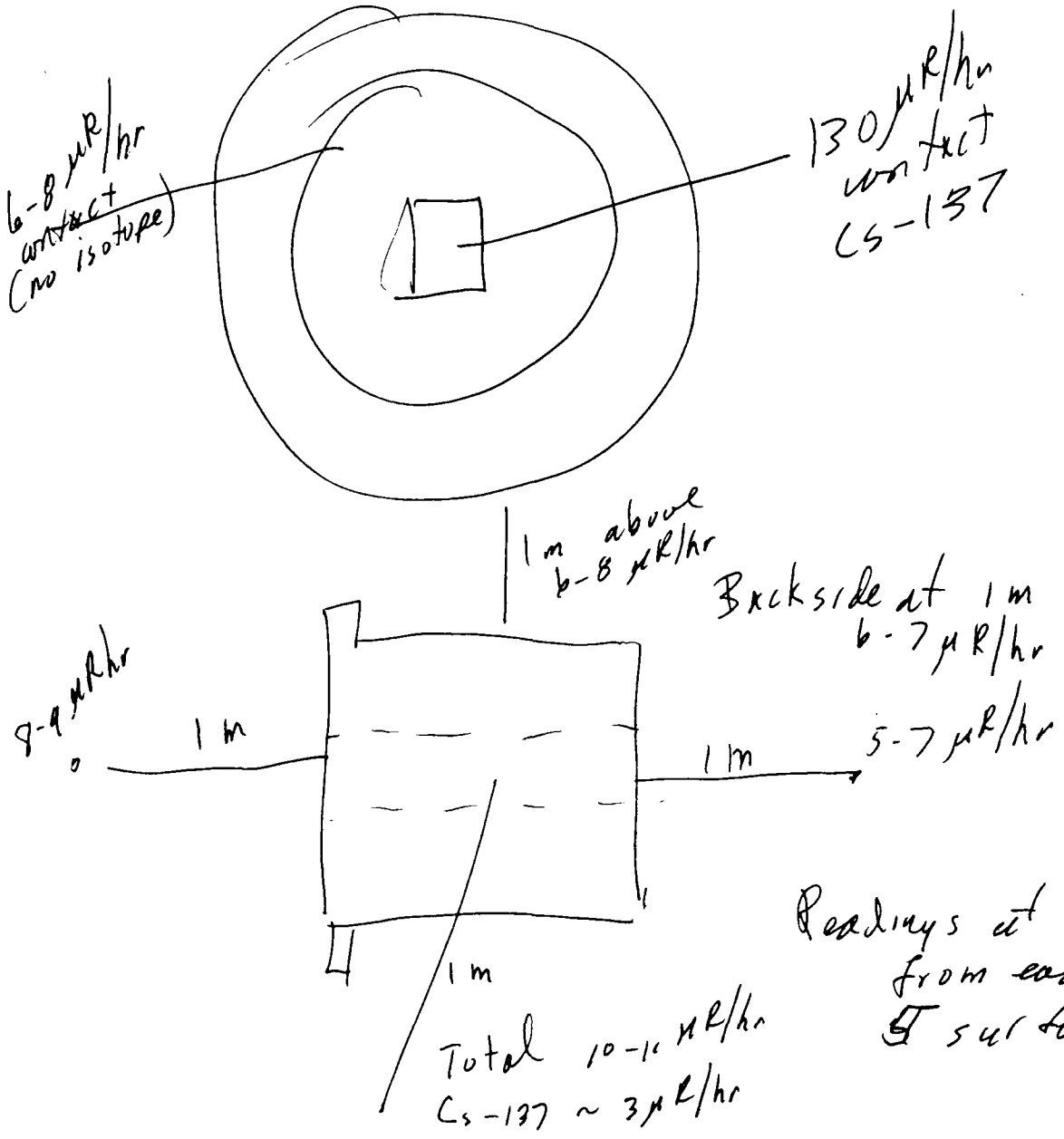
Notes: Larry Jense
Gerald Gels

4/12/01

Jbitt Melt Shop
3100 S California - Chicago

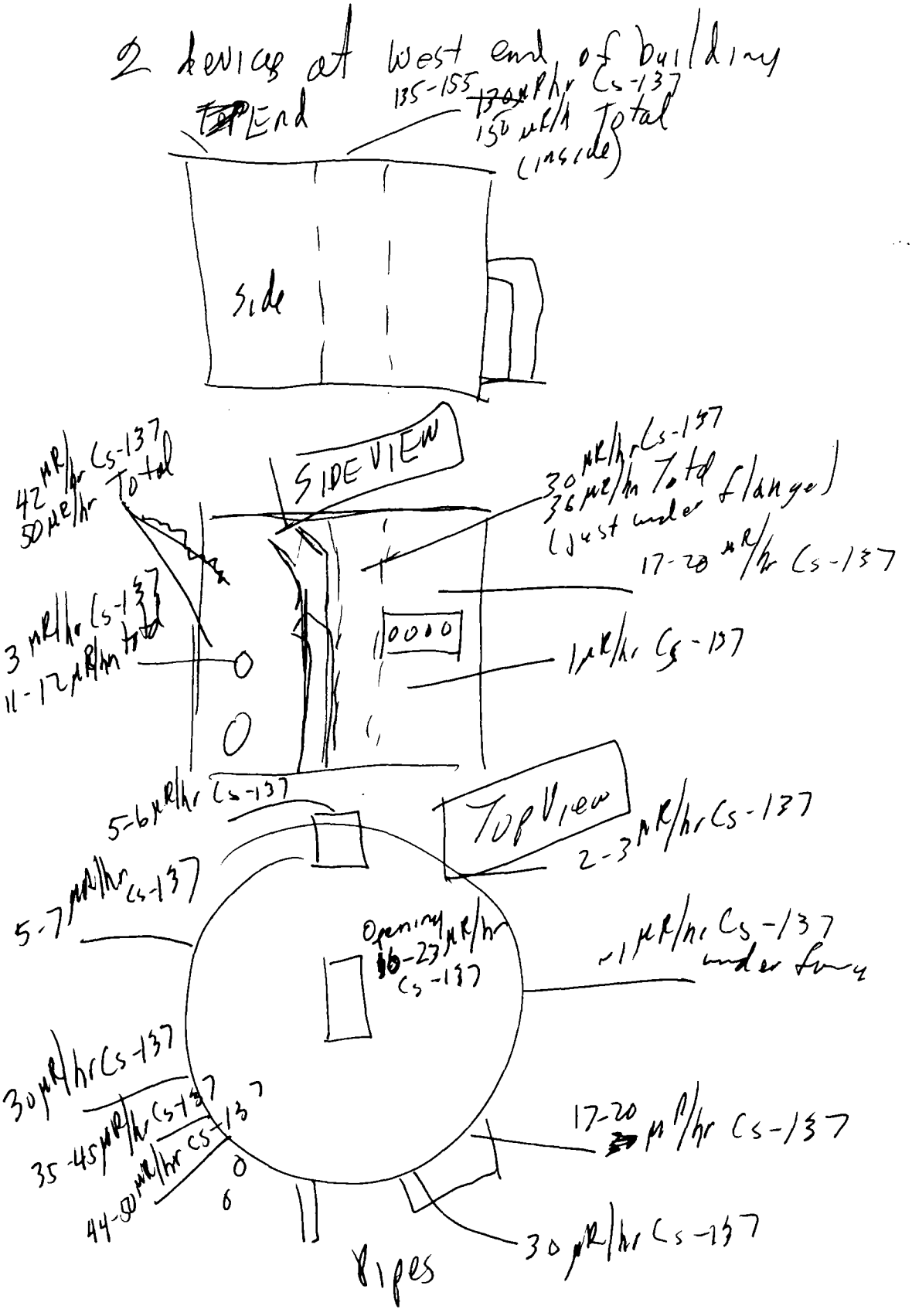


End

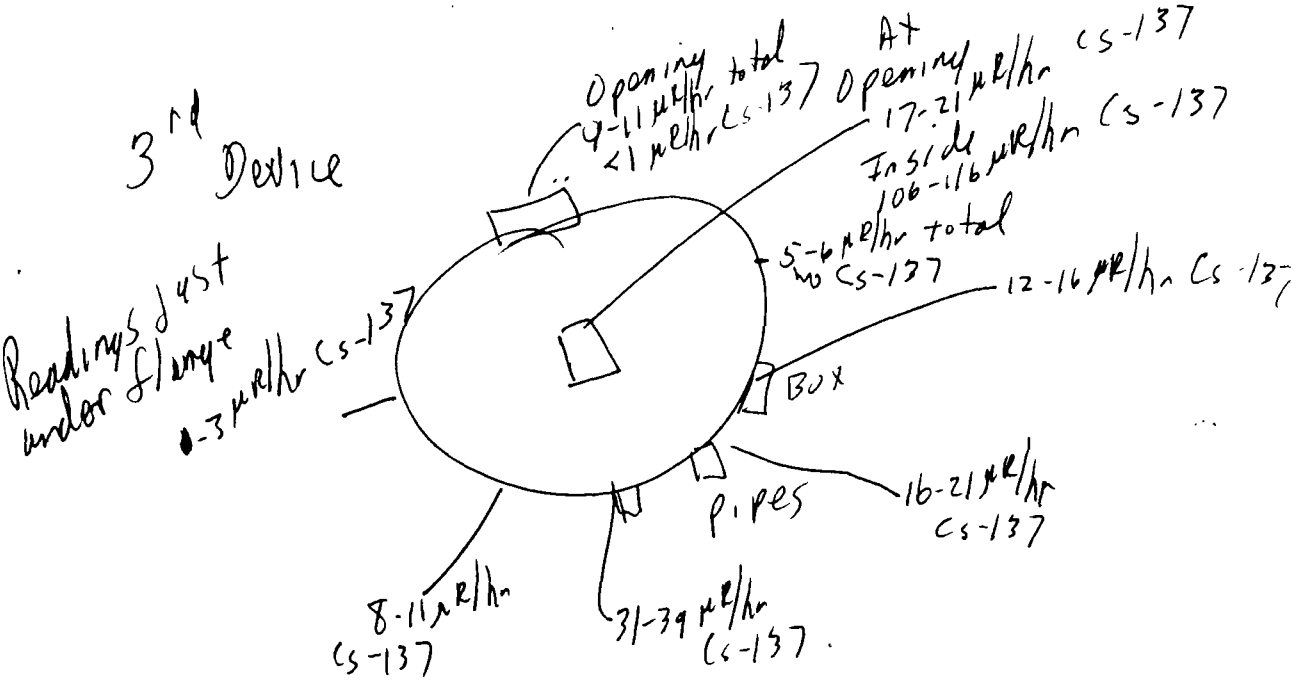


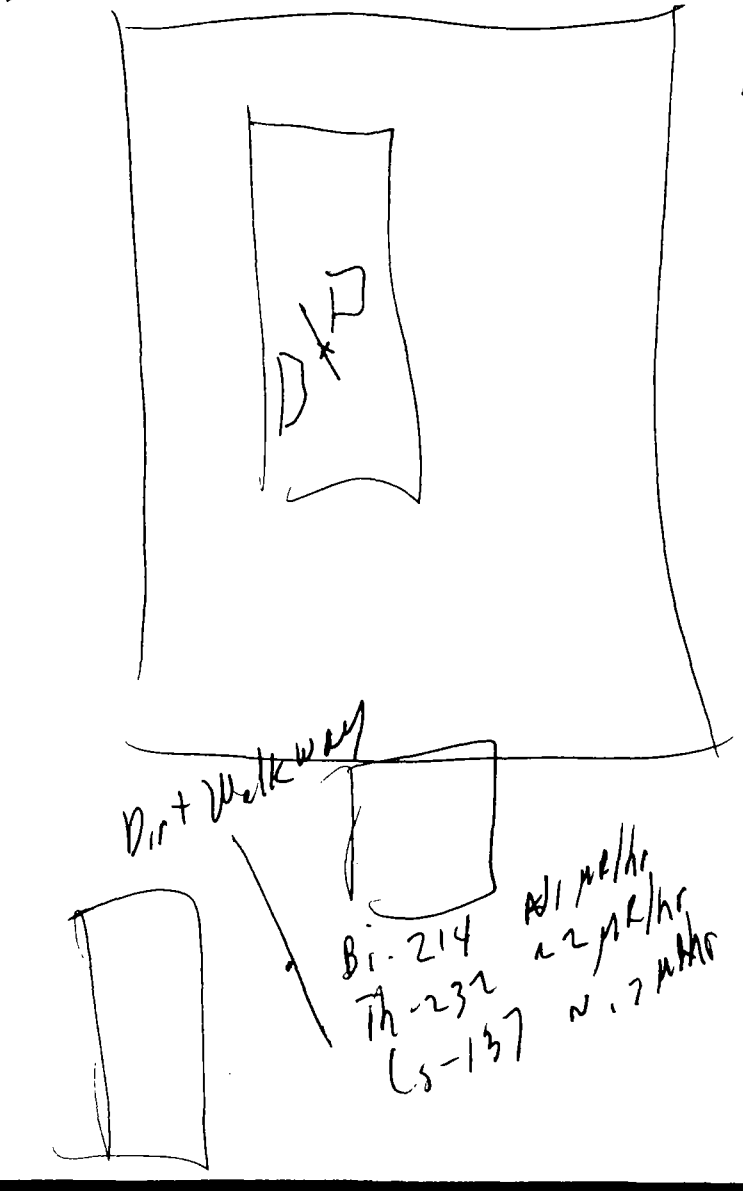
Readings at 1 meter from each of 5 surfaces

2 devices at West end of Building

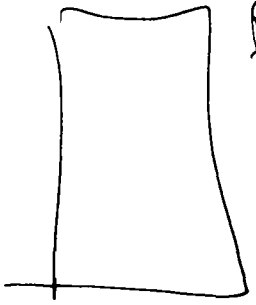


3rd Device


Opening total
4-11 μR/hr Cs-137
<1 μR/hr Cs-137
At Opening μR/hr Cs-137
17-21
Inside μR/hr Cs-137
106-116
5-6 μR/hr total
5-6 μR/hr Cs-137
12-16 μR/hr Cs-137
Readings just under flange
1-3 μR/hr Cs-137
BOX
Pipes
16-21 μR/hr
Cs-137
8-11 μR/hr
Cs-137
31-39 μR/hr
Cs-137


Dirt + Walkway
Bi-214
Th-232
Cs-137
Elevated readings on dirt -

On upper level South of "caldron"

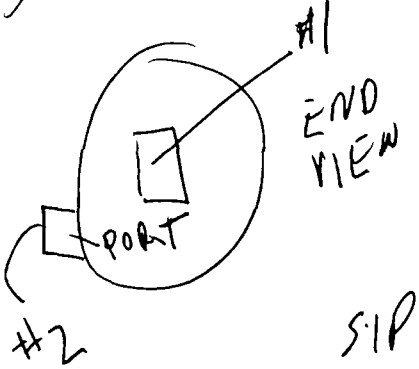


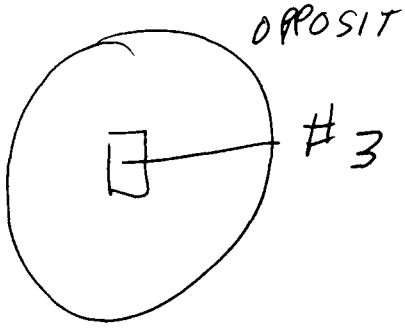
Bags on contact

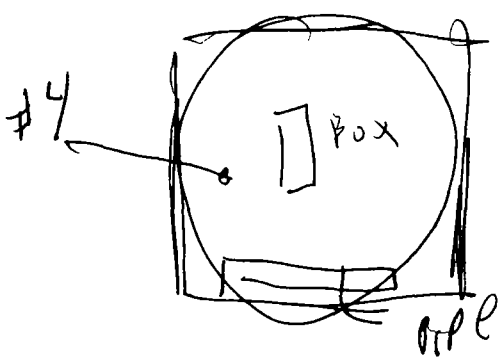
B_i-214	15-20 μR/hr
Unident.	~13 μR/hr
Th-232	2-4 μR/hr
Total	~36 μR/hr
	33-48

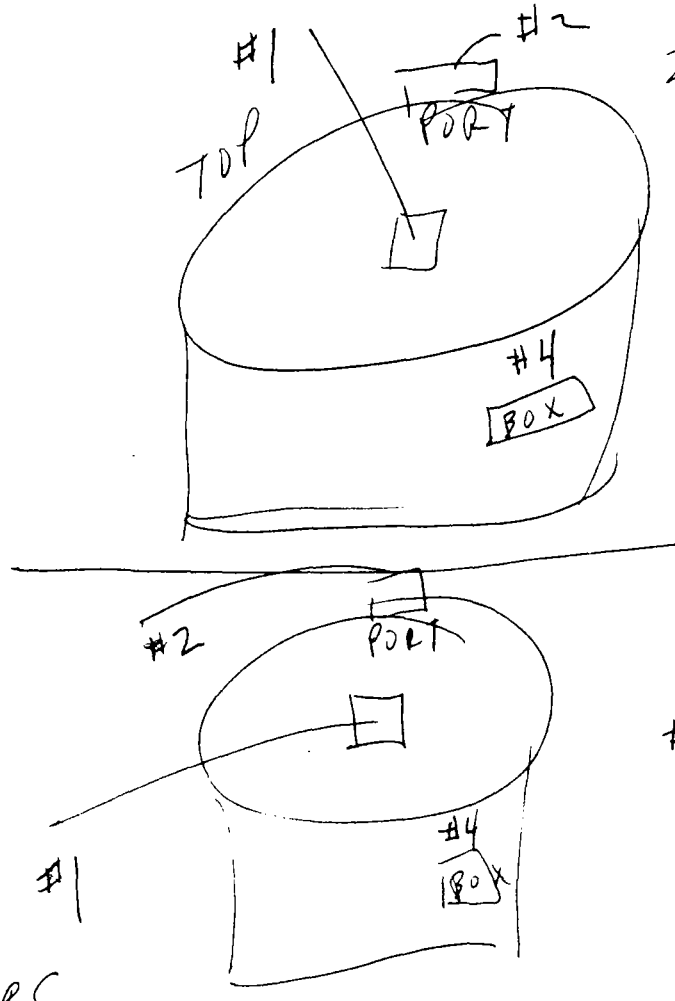
Mar Patch-2
Martin Marietta
Magnesia Specialties, Inc.
"For repairs of spouts, runners, and trundishes"

Smears on device at exst end









2nd device
West Device #1

#3 - not taken, opp end ~~of~~ on floor + unaccessible

3rd device
West Device #2

#3 - not taken, opposite end on floor and unaccesible

SMEARS

East Device
- #1 44 cpm
- #2 41
- #3 52
- #4 43

West Device #1
- #1 46 cpm
- #2 45
- #4 47

West Device #2
- #1 39 cpm

Blank
46 cpm

Turn page for calibration data + counting data

[redacted]

10

1 Cs-137 "needle" found in emp-[illegible] in ~~SE~~ W corner of building
4.5 mR/hr on contact, 10 "needles"
(Block structure)

Refractory "oven" in west most of 2 small buildings in SW corner

4/17/01 - Calibration + Counting of smears

Ludlum 2929 Scaler S/N 158794
Ludlum 43-10-1 Counting tray S/N PR162337
Sr-90 Calibration Source 12,200 dpm @ 11/29/95
S/N 2101-95, DNS 14

1 minute counts of Sr-90
4148/4122/4254 Average 4175 cpm
1 minute count of blank smear
38/50/51 Average 46 cpm
West Device #1
Smear #1 - [1 minute counts] - 47/49/41 ⇒ Mean 46 cpm
#2 - [3 minute count] - 134 ⇒ 45 cpm
#3 - [3 minute count] - 142 ⇒ 47 cpm
West Device #2 - 3 minute counts

[redacted]

East Device - 3 minute counts

Smear #1 - 133 ⇒ 44 cpm

#2 - 124 ⇒ 41

#3 - 156 ⇒ 52

#4 - 129 ⇒ 43